



SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

# PET

(Ph.D. ENTRANCE TEST)

## SYLLABUS

**SUBJECT: BOTANY (HORTICULTURE)**

### Section-B

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#### **UNIT – I: FUNDAMENTALS OF HORTICULTURE**

Introduction to Horticulture: Definition, branches, scope and economic importance of horticultural crops, Nutritive value of fruits and vegetables, Classification of horticultural crops based on Climatic requirements, Season of growth, Plant parts used for consumption, Botanical classification and Horticultural zones of India and Maharashtra, Principles of Horticulture: Soil and climatic requirements of horticultural crops, Selection of site for establishment of orchard, Planning, layout and planting of orchard, Bearing habit, fruit bud differentiation and flower and fruit drop, Training and pruning, Fruitfulness and unfruitfulness and Cropping system, Management Horticulture: Orchard management, Nutrition management, Water management, Weed management and Plant protection, Applied Horticulture: Mechanism of action and biological effect of following plant growth regulators- Auxins, Gibberellins, Cytokinins and Ethylene. Special horticultural practices in: Fruit crops: Bahar treatment, Girdling, Notching, Ringing and Bending. Vegetable crops: Earthing up, Staking, Blanching. Flower crops: Pinching, Disbudding and Deshooting.

#### **UNIT – II: PROPAGATION AND NURSERY MANAGEMENT**

Propagation: Basic concept, types of plant propagation along with merits and demerits, Seed treatment, seed germination and seed dormancy, Polyembryony and apomixes, Stock - scion relationship and Factors affecting Budding and grafting. Common origin method: Cutting: Root cutting, Stem cutting and Leaf cutting Layering: Simple layering, Air layering and Mound layering. Specialized structures: Bulbs, Tubers and Rhizomes. Separate origin method: Budding: Shield budding, Patch budding and Ring budding. Grafting: Simple grafting, Tongue grafting and Veneer grafting, Nursery Management: Definition, importance, scope and types, Site selection, components and layout of nursery, Media containers and propagation structures, After care in nursery and Nursery Act

#### **UNIT – III: PRODUCTION TECHNOLOGY FRUIT CROPS**

Introduction to tropical and sub-tropical fruit crops: Importance of fruit growing in India and Maharashtra, Nutritive value of fruits, Area and production of India and Maharashtra, Exports and imports of fruits in India and Constraints in fruit production and remedies to overcome them, Cultivation practices of tropical, sub-tropical, arid, minor and plantation fruit crops: Origin, history, distribution, area and production, uses and composition, varieties, soil and climatic requirements, propagation, planting, training and pruning, manuring and fertilizer application, irrigation, intercropping, harvesting and yield disease and pests of fruit crops mentioned below:



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Banana, Guava, Papaya, Sapota, Citrus fruits: Kagzi lime, Sweet orange and Mandarin, Grapes, Mango, Pomegranate, Aonla, Ber, Custard Apple, Fig, Tamarind, Jamun, Bael, Wood apple, Coconut, Cashewnut, Tea and Coffee, Major physiological disorders of following fruit crops: Mango: Alternate bearing and Spongy tissue, Citrus: Granulation and Gummosis, Bareness in grapes, Fruit cracking in pomegranate

#### UNIT-IV: PRODUCTION TECHNOLOGY VEGETABLE CROPS

General account: Importance and scope of Olericulture, Nutritive value of vegetables, Classification of vegetables and Types of vegetable gardening, Cultivation practices of Solanaceous, Cucurbitaceous, Leguminous, Cruciferous, Alvaceous, Chenopodiaceous, Apiaceous, Moringaceous, Amaryllidaceous, Amerantaceous and Convolvulaceous Vegetable Crops: Origin, history, distribution, area and production, uses and composition, varieties, soil and climatic requirements, propagation, planting, training and pruning, manuring and fertilizer application, irrigation, intercropping, harvesting and yield disease and pests of vegetable crops mentioned below: Tomato, Brinjal, Potato, Bitter gourd, Ridge gourd, Cucumber, Cluster bean, Garden pea, Methi(Fenugreek), Cabbage, Cauliflower, Radish, Okra (Bhendi), Indian spinach, Beet root, Carrot, Anethum (Shepu), Drumstick, Onion, Tandulja and Sweet potato

#### UNIT – V: ORNAMENTAL AND LANDSCAPE GARDENING

Principles Of Landscape Gardening: Importance and scope of landscape gardening, History of landscape gardening, Art principles, Some important terms of landscape gardening, Garden adornments, Garden features : Walls, Fencing, Steps, Garden, Garden drives and paths, Hedges, Edges, Arches, Pergola, Lawn, Carpet bedding, Flower beds, Shrubbery, Borders, Rockery, Water gardens, Bonsai and Topiary, Gardens types and styles: Garden types: Indoor garden and Outdoor garden, Garden styles: Formal gardens, Informal gardens and Freestyle gardens.

#### UNIT – VI: COMMERCIAL FLORICULTURE

Cultivation practices: Origin, history, area, production, economic importance, soil and climate, varieties, propagation, nursery raising, transplanting, manuring, irrigation, after care, plant protection, use of growth regulators, special horticultural practices, harvesting, post harvest handling, grading, packing, storage, transportation and marketing of following flowering plants- Rose, Jasmine, Tuberose, Gladiolus, Carnation, Orchids, Chrysanthemum, Aster, Marigold, Gaillardia, Gerbera and Dahlia

#### UNIT VII: PRODUCTION TECHNOLOGY OF SPICES AND CONDIMENTS CROPS

**Introduction to spices and condiments, Cultivation practices Spices and Condiments Crops:** Geographical distribution of spices and condiments, area, production, history, origin, distribution, varieties, soil and climatic requirements, propagation and planting, after care, manures and fertilizers, irrigation, processing , harvesting, grading, packing and marketing of



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following crops : Turmeric, Coriander, Cardamom, Ginger, Fenugreek, Clove, Cumin, Chilli, Mustard, Curry leaf, Black pepper, Garlic, All spice, Saffron and Nutmeg.

#### **UNIT VIII: PRODUCTION TECHNOLOGY OF MEDICINAL AND AROMATIC PLANTS**

Introduction to medicinal and aromatic plants, Cultivation practices of Medicinal and Aromatic Plants: History, origin, distribution, propagation, cultural practices, nutrition and water management, harvesting, processing and marketing of following plants: Dioscoria, Rauwolfia, Opium, Periwinkle, Aloe, Guggul, Plantago, Coleus, Stevia, Senna, Solanum, Sandalwood, Mehendi, Mint and Lemon Grass

#### **UNIT – IX: POST HARVEST HANDLING OF HORTICULTURAL CROPS**

Introduction: Importance of Post Harvest Handling, Maturity and maturity indices of Horticultural crops, Harvesting methods of Horticultural crops, Factors responsible for Maturity, Ripening and Deterioration of Horticultural crops: Pre harvest factors: Selection of varieties, Cultural operations, Pre harvest treatments, Maturity, Harvesting Post harvest factors: Curing, Degreening, Pre cooling, Washing and drying, Storing and grading, Disinfestation, Post harvest treatments and Waxing, Methods used for hastening and delaying ripening: Chemical that hasten ripening and Chemicals that delay in ripening, Respiration and Transpiration in relation to Harvesting, Packing, Transportation and Storage, Nature and causes of deterioration: Primary causes of losses: Mechanical losses, Physio –biochemical losses, Microbial losses and Physical losses. Secondary causes of losses, Methods of precooling, grading, packaging storage and transportation of Horticultural crops.

#### **UNIT – X: PROCESSING OF HORTICULTURAL CROPS**

Introduction: History of Food Preservation, Importance and Scope of Fruit and Vegetable Preservation, Selection of Site for Fruits and Vegetables Preservation Unit and Principles and Methods of Preservation, Methods of Food Preservation: Dehydration of Fruits and Vegetables, Canning of Vegetables, Food Preservatives, Colours and Flavours used in Food Industry. Preparation of fruit products : Mango pulp, Papaya jam, Grape juice, Apple jelly, Citrus squash & marmalade. Preparation of vegetable products: Tomato juice, Tomato sauce, Garlic and Ginger paste, Chilli pickle and Mixed Vegetable Pickle

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**Crops:** Geographical distribution of spices and condiments, area, production, history, origin, distribution, varieties, soil and climatic requirements, propagation and planting, after care, manures and fertilizers, irrigation, processing, harvesting, grading, packing and marketing of following crops : Turmeric, Coriander, Cardamom, Ginger, Fenugreek, Clove, Cumin, Chilli, Mustard, Curry leaf, Black pepper, Garlic, All spice, Saffron and Nutmeg.

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